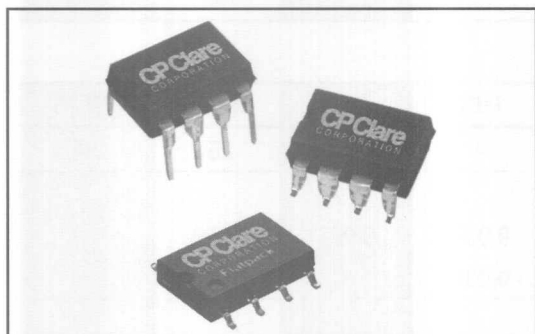


# LOC110/LOC111/LOC112

## Linear Optocouplers



### DESCRIPTION

CP Clare's LOC110/LOC111/LOC112 Linear Optocouplers feature an infra-red LED optically coupled with two phototransistors. One feedback phototransistor is used to generate a control signal that provides a servomechanism to the LED drive current thus compensating for the LED's nonlinear time and temperature characteristics. The other (output) phototransistor provides an output signal that is linear with respect to the servo LED current.

### FEATURES

- 8 pin Flatpack or DIP package (PCMCIA Compatible)
- Couples analog and digital signals
- Wide bandwidth (>200kHz)
- High gain stability
- Low input/output capacitance
- Low power consumption
- 5300 VAC peak input/output isolation available
- 0.01% servo linearity
- THD 87dB typical
- UL recognized file #: E76270
- CSA file #: LR43639-10
- BSI certificate #: 7691  
7693  
7694  
7669

### APPLICATIONS

- Modem transformer replacement with no insertion loss
- Digital telephone isolation
- Power supply feedback voltage/current
- Medical sensor isolation
- Audio signal interfacing
- Isolation of process control transducers

### RATINGS (@ 25°C)

Parameter	Min	Typ	Max	Units
Input Power Dissipation	-	-	150 <sup>1</sup>	mW
Input Control Current	-	-	100	mA
Peak (10ms)	-	-	1	A
Total Package Dissipation	-	-	500 <sup>2</sup>	mW
Isolation Voltage				
Input to Output	2500	-	-	V <sub>RMS</sub>
"E" Suffix (optional)	3750	-	-	V <sub>RMS</sub>
Operational Temperature	-40		+85	°C
Storage Temperature	-40	-	+125	°C
Soldering Temperature (10 Seconds Max)	-	-	+260	°C

<sup>1</sup> Derate Linearly 1.33 mW/°C

<sup>2</sup> Derate Linearly 1.67 mW/°C

For additional information ask for our LOC Series Application Note No. 1003.  
For detailed information on all CP Clare Products ask for our Data Book.

**Input Characteristics @ 25°C**

PARAMETERS	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
LED Voltage Drop	$I_F = 2\text{-}10\text{mA}$	$V_F$	0.9	1.2	1.4	V
Input/Output Capacitance		$C_{I/O}$	-	3	-	pF
Reverse LED Current	$V_R = 5\text{V}$	$I_R$	-	-	10	$\mu\text{A}$
Reverse LED Voltage		$V_R$	-	-	5	V
Forward LED Current		$I_F$	-	-	100	mA

**Coupler/Detector Characteristics @ 25°C**

PARAMETERS	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
Dark Current	$I_F = 0\text{mA}$ , $V_{CC} = 15\text{V}$	$I_D$	-	1	25	nA
K1, Servo Gain ( $I_1/I_F$ )						
LOC110, LOC112	$I_F = 2\text{-}10\text{mA}$ , $V_{CC} = 15\text{V}$	K1	0.004	0.007	0.030	-
LOC111	$I_F = 2\text{-}10\text{mA}$ , $V_{CC} = 15\text{V}$	K1	0.008	-	0.030	-
K2, Forward Gain ( $I_2/I_F$ )						
LOC110, LOC112	$I_F = 2\text{-}10\text{mA}$ , $V_{CC} = 15\text{V}$	K2	0.004	0.007	0.030	-
LOC111	$I_F = 2\text{-}10\text{mA}$ , $V_{CC} = 15\text{V}$	K2	0.006	-	0.030	-
K3, Transfer Gain ( $K_2/K_1$ ) <sup>1</sup>	$I_F = 2\text{-}10\text{mA}$ , $V_{CC} = 15\text{V}$	K3	0.55	-	1.43	-
$\Delta K3$ , Transfer Gain Linearity <sup>1</sup> (non-servoed)	$I_F = 2\text{-}10\text{mA}$	$\Delta K3$	-	-	1.0	%
K3 Temperature Coefficient	$I_F = 2\text{-}10\text{mA}$ , $V_{det} = -5\text{V}$	$\Delta K3/\Delta T$	-	0.005	-	%/°C
Common Mode Rejection Ratio	$V = 20\text{V}_{p-p}$ , $R_L = 2\text{K}\Omega$ , $F = 100\text{Hz}$	CMRR	-	130	-	dB
Input/Output Isolation		I/O	2500	-	-	$V_{RMS}$
"E" Suffix (optional)			3750			$V_{RMS}$
Total Harmonic Distortion	$F_0 = 350\text{Hz}$ , 0dBm	THD	-96	-87	-80	dB
Frequency Response	Photoconductive Operation	BW (-3dB)	-	200	-	kHz
	Photovoltaic Operation	BW (-3dB)	-	40	-	kHz

<sup>1</sup>LOC111 and LOC112 Bins D E F G.

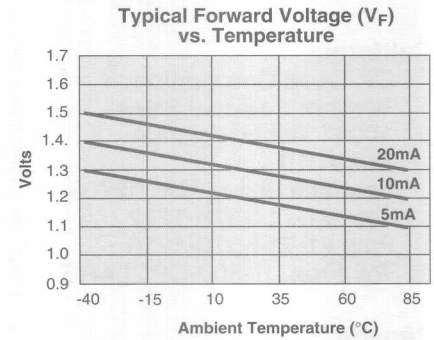
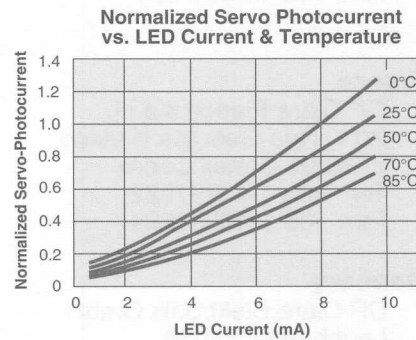
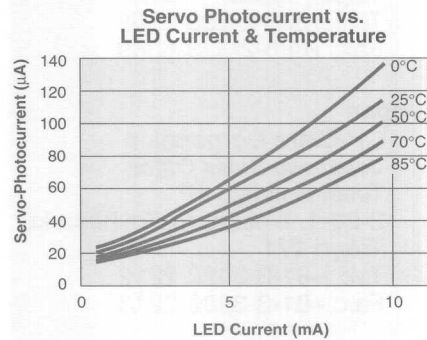
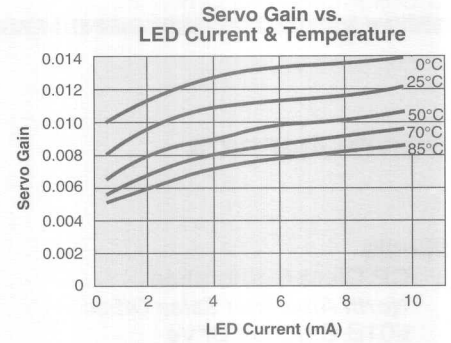
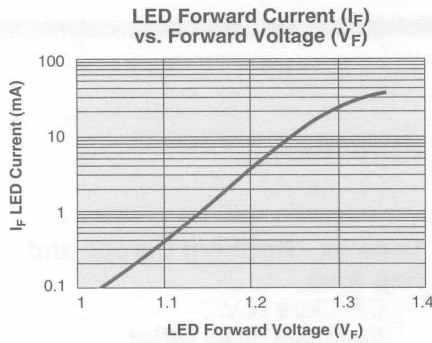
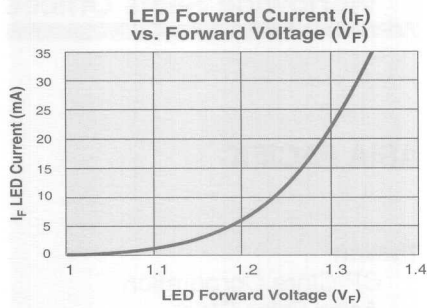
**K3 Sorted Bins**

Bin A = 0.550-0.605
Bin B = 0.606-0.667
Bin C = 0.668-0.732
Bin D = 0.733-0.805
Bin E = 0.806-0.886
Bin F = 0.887-0.974
Bin G = 0.975-1.072
Bin H = 1.073-1.179
Bin I = 1.180-1.297
Bin J = 1.298-1.426

- The LOC110/LOC111/LOC112 are shipped in anti-static tubes of 50 pieces. Each tube will contain one K3 sorted bin.
- Bin designation marked on each device (A-J).
- Orders for the LOC110 product will be shipped using bins available at the date of the order. Any bin (A-J) can be shipped.
- For customers requiring selected bins D E F G we offer part number LOC111 or LOC112.

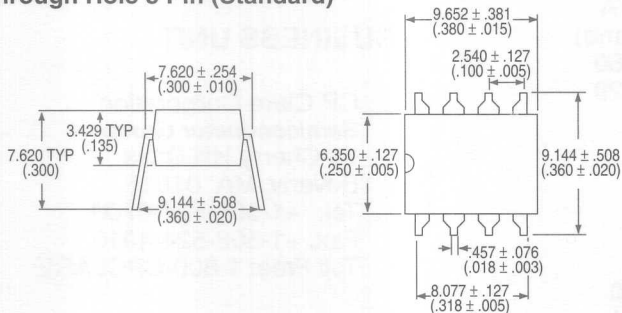
**Example:**


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 For detailed information on all CP Clare Products ask for our Data Book.

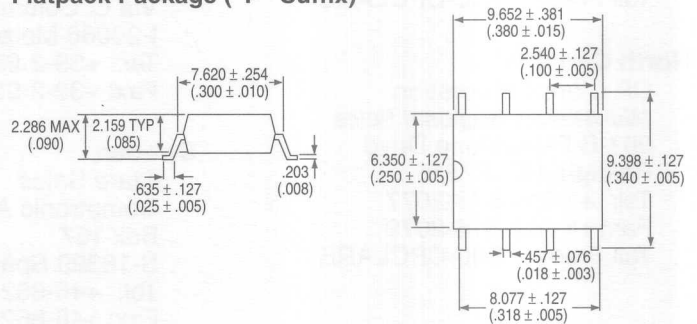


## MECHANICAL DIMENSIONS

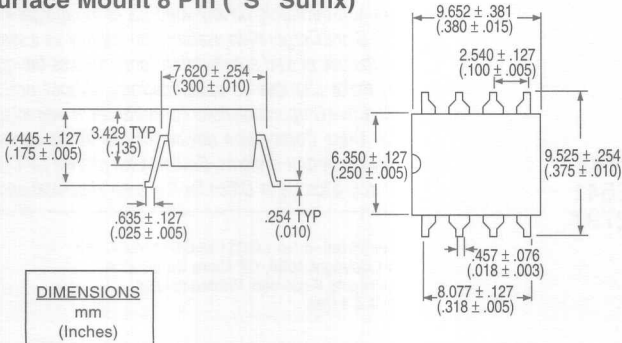
### Through Hole 8 Pin (Standard)



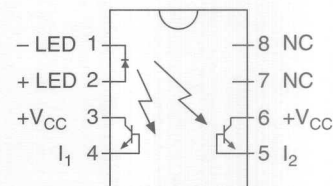
### Flatpack Package ("P" Suffix)



### Surface Mount 8 Pin ("S" Suffix)



## PACKAGE PINOUT



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For detailed information on all CP Clare Products ask for our Data Book.

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